GENERAL POLICIES -PRESENTATION OF DATA

The Nuclear Data Sheets are publications prepared from ENSDF, the computer file of Evaluated Nuclear Structure Data maintained by the National Nuclear Data Center on behalf of the International Network for Nuclear Structure and Decay Data Evaluations. See page iii for a list of the members of this network and their mass range evaluation responsibility. The Nuclear Data Sheets publication reflects the organization of ENSDF which is made up of a collection of "data sets". For a given nuclear species, these data sets present one of the following two kinds of information:

> a) The evaluated results of a single experiment, such as a radioactive decay or a nuclear reaction, or the combined results of a number of experiments yielding basically the same type of information, such as (Heavy Ion,xnγ), or Coulomb excitation.

> b) The adopted properties of the nucleus.

Discussed below are some of the general policies followed in the presentation of material in the Nuclear Data Sheets.

A. ADOPTED LEVELS , ADOPTED GAMMA RADIATIONS

The Adopted Levels and Adopted gammas data sets represent the best. values for the level and gamma properties as determined by the evaluator on the basis of all the available data. Jπ assignments are made on the basis of the strong and weak arguments outlined in SUMMARY OF BASES FOR SPIN PARITY ASSIGNMENTS on NDS Introductory pages.

1. The following quantities are always included in the adopted data sets.

For levels:

> a) Energies (in keV, relative to the ground state).
> b) Spin and parity (Jπ) with arguments justifying the assignment. See NDS Introductory pages
>
> c) Half-life (T1/2) (in time units or total width in energy units).
>
> d) Decay branching (%) for the ground state and all isomers.
> e) Static electric and magnetic moments.
> f) Q- (β- decay energy); S(n), S(p) (neutron and proton separation energies); Q(a) (a decay energy).
> g) Summary of data sets in which each level is seen.

For gammas :

> a) Placement in level scheme.
> b) Energy (in keV).
> c) Photon branching (normalized to 100 for the most intense transition from each level).
>
> d) Multipolarity (including the mixing ratio and penetration parameters if determined).
> e) Total conversion coefficient (when larger than about 0.001).
> f) Reduced transition probabilities in single-particle Weisskopf

units.

Additional level properties related to special cases or restricted mass regions are

   a) Configuration assignments (for example, Nilsson orbitals in deformed nuclei, shell-model assignments in spherical nuclei, isobaric spin in light nuclei).
   b) Band parameters (for example rotational bands in deformed regions, multiplets in the lead region).
   c) Isomer shifts, isotope shj.fts (known in only a small number of cases).
   d) Charge distributions of ground states (usually only a literature reference is given).
   e) Deformation parameters of ground states (model dependent).
   f) Electric or magnetic excitation probabilities (BE2, BMl etc.) when the level half-life and ground-state branching are not known.

For reaction-specific properties, such as spectroscopic factors, logft's, L transfers, the individual experimental data sets should be consulted.

2. The excitation energies for levels connected by gamma transitions are taken from a least-squares fit to the adopted gamma energies. Other excitation energies are based on best values from all available reactions.

3. For ground state and isomeric state decay branches, in cases where more than one decay branch is allowed but one branch is dominant, this branch is rounded off to 100 when the competing branches total less than approximately 0.001%. When only one branch has been observed, and no estimate (for example from systematics) can be made for the expected competing branches, the observed branch is given as %BR$\leq$lOO and the competing branch(es) as %BR-?

4. Tabulated total conversion coefficients, given under the Q heading are theoretical values (see GENERAL POLICIES -"THEORY") based on the indicated multipolarity and mixing ratios. In cases of mixed transitions where the mixing ratio, δ, is not known, or where more than two components are being allowed for, the Q value given is an average of the smallest and largest values for the indicated multipolarities, with an uncertainty chosen to overlap these same values. Values for Q are quoted, in general, only when $\alpha/(l+\alpha)>O.OOl$.

5. The use of parentheses and square brackets is discussed in 13. and 14. below.

B. REACTION AND DECAY DATA SETS

6. Jπ values quoted in reaction data sets are from adopted levels unless noted otherwise. In the case of thermal neutron capture, the Jπ value for the "capturing" state is based on the assumption of s-wave capture unless noted otherwise.

7. In decay data sets, Jπ values and gamma ray multipolarity and δ values from the adopted levels and gammas data sets are given where known. This policy ensures that the total transition intensities and the resulting intensity imbalances (from which, in general, the β branches and thus the logft values are deduced), reflect the best available data.

8. Alpha intensities are presented in the tables and in the drawings as intensities per 100 alpha decays. The alpha branching ratio, needed to convert to intensities per lOO decays of the parent, is given both in the drawings and in the tables.

9. β- and ε+β+ intensities are presented in the tables and in the drawings as intensities per 100 decays of the parent unless noted otherwise. The intensities of the β- and ε+β+ branches are deduced from the (γ+ce)- intensity imbalances unless noted otherwise. The separation of I(ε+β+) into I(ε) and I(β+) is based on theoretical ε/β+ ratios (71Go40) unless stated otherwise.

10. Gamma intensities in the tables are presented as relative values (as opposed to branching ratios from each level) whenever possible. The conversion factor needed to get absolute intensities, (photons per 100 decays of the parent for decay data sets, or photons per 100 neutron captures for (n,γ) data sets, etc.), is given in a footnote. Where only branching ratios are available, the intensities are so noted and the gammas are ordered according to the parent level.

II. Experimental internal conversion data are generally not given except for high-precision values, and for E0 and anomalous transitions.

12. Radiations from neutron or proton resonances are not, in general, presented; however, the energies, and other level properties for bound levels deduced from resonance experiments are included. Eγ and Iγ from thermal neutron capture are included.

13. Parentheses around a value for an energy or an intensity indicates a value not measured in that data set but taken from some other experiment, or not measured at all but expected. When used, the exact meaning of the parentheses is explained in a comment. Parentheses around a value for a Jπ, γ multipolarity or L transfer, indicates that the values for these quantities are tentative. The use of parentheses around Jπ conforms to the rules referred to above.

14. Square brackets around a gamma ray multipolarity or an L transfer value indicates a value deduced solely on the basis of known or expected Jπ values.

15. In all cases where weighted averages are taken, the quoted experimental uncertainties are assumed to be one sigma statistical values.

16. References which contain the major contributions to data in a specific data set are given explicitly with the data set heading when such references are three or fewer in number. These major references will then also appear with the data set headings in the drawings.